Transplantation Proceedings

AN OFFICIAL PUBLICATION OF THE TRANSPLANTATION SOCIETY

Contents of Volume I, Index of Authors and Subjects

CONTENTS

No. 1 (March)

Message from NIH. *Dorland J. Davis* 1
Second International Congress of the Transplantation Society: Organization and Support 2
Dedication of Congress to Dr. George D. Snell. *R. E. Billingham* 3
Foreword: Transplantese—1969. *John Marquis Converse and Felix T. Rapaport* 14

SYMPOSIUM ON BONE MARROW TRANSPLANTATION

Bone Marrow Transplantation in Man. *G. Mathé, J. L. Amiel, L. Schwarzenberg, M. Schneider, A. Cattan, Y. R. Schlumberger, K. Nouza and Y. Hrask* 16
Experimental Aspects of Bone Marrow Transplantation in Primates. *D. W. van Bekkum, H. Balner, K. A. Dicke and L. M. van Putten* 25
Symposium on Bone Marrow Transplantation: Experimental Aspects in Canines. *E. Donnall Thomas, Rainer Storb, Robert B. Epstein and Robert H. Rudolph* 31
Effect of Syngeneic Antilymphocyte Serum on Rat-Mouse Radiation Chimeras. *N. Gengozian and C. C. Congdon* 34
Immunological Considerations of Bone Marrow Transplantation. *Delta E. Uphoff* 39
Allogeneic Marrow Transplants in Cyclophosphamide Treated Mice. *George W. Santos and Albert H. Owens, Jr.* 44

SYMPOSIUM ON PREGNANCY AND TRANSPLANTATION

Histoincompatibility and the Survival of the Fetus: Current Controversies. *Richard L. Simmons* 47
Is the Trophoblast Antigenic? *D. R. S. Kirby* 53
The Differentiation of Trophoblast Giant Cells in the Mouse, Studied in Kidney Capsule Grafts. *Gordon B. Avery and Carl V. Hunt* 61
The "Immunological Inertia" of Viviparity. *J. M. Anderson* 67

Evidence of Allograft Rejection of the Conceptus. *Edward J. Breyere and Wolfgang W. Sprenger* 71
Histocompatibility Antigens on the HL-A Locus in Gestational Choriocarcinoma. *B. Mogensen, F. Kissmeyer-Nielsen and M. Hauge* 76
HL-A Antigens and Choriocarcinoma. *Eva Ivaskova, Jaroslava Jakoubkova, M. Zavadil, V. Schneid, P. Koldovsky and P. Ivanyi* 80
Association of Maternal Gentoype and Excess Heterozygosity for Ag-B Histocompatibility Antigens among Male Rats. *Joy Palm* 82

SYMPOSIUM ON CANCER, IMMUNOLOGY AND TRANSPLANTATION

Studies on the FMR Antigen. *Frank Lilly and Stanley G. Nathenson* 85
Studies on Immunity to Autochthonous Mouse Tumors. *Ingegerd Hellström, Karl Erik Hellström, George E. Pierce and Alexander Fefer* 90
Cytotoxic Antibodies against Adeno Tumors in Rabbit Anti-Adenovirus Immune Sera. *Hans O. Sjogren and J. Ankerst* 95
Antilymphocytic Serum and Polyoma Oncogenesis in Rats. *M. Vandeputte* 100
Malignant Lymphomas in Transplantation Patients. *I. Penn, W. Hammond, L. Brettschneider and T. E. Starzl* 106
Are the Neontigens Induced by Chemical Carcinogens or by Leukaemogenic Viruses Particular to Cancer Cells? *G. Mathé* 112
Demonstration of Specific Antigen(s) on the Surface of SV40—Transformed Cells Using the Mixed Hemagglutination Technique. *P. Hayry and V. Defendi* 119
The HL-A Leucocyte System in Down's Snydrome. *R. Harris, J. Timson and J. Wentzel* 122
Immunity against the Ehrlich Ascites Carcinoma Produced by Bacterial Endotoxins. *Edward B. Hager, George L. Bailey, Constantine L. Hampers and John P. Merrill* 124

SYMPOSIUM ON ORGAN PRESERVATION

Current Problems of Tissue Banking. *K. Ostrowski* 126
Conservation of the Liver. *Lawrence Brettschneider, Peter R. F. Bell, Alfred J. Martin, Jr., John S. Tarr, Paul D. Taylor and Thomas E. Starzl* 132
Hypothermic-Hyperbaric Pulsatile Perfusion for Preservation of the Canine Heart. *John A. Feemster and Richard C. Lillehei* 138
Asanguinous Perfusion Preservation of Canine Liver and Heart Using a Simple Manuable Portable Apparatus. *M. Slapak, R. A. Wigmore, R. Demers, A. K. Chandrasakeram, J. G. Beaudoin, G. Malave and L. D. MacLean* 147
A Mobile System for Cadaver Kidney Preservation. *J. R. W. Ackermann, W. I. Hopkinson and W. S. Gradman* 153

SYMPOSIUM ON KIDNEY TRANSPLANTATION

Opening Remarks. *Jean Hamburger* 160
Medical Aspects of Transplantation. *John P. Merrill* 162
Some Immunological and Surgical Aspects of Kidney Transplantation in Man. *D. M. Hume, J. Leo, R. T. Rolley and G. M. Williams* 171

Some Practical Problems in Kidney Transplantation. *Anthony Walsh* 178
Mechanisms of Kidney Allograft Rejection. *John S. Najarian and John E. Foker* 184
The Contribution of Kidney Transplantation to the Study of Glomerulonephritis—The Recurrence of Glomerulonephritis in Renal Transplants. *F. J. Dixon, J. J. McPhaul and R. A. Lerner* 194
An Analysis of the Incidence of Early Transplant Failure Data from the Human Kidney Transplant Registry. *Advisory Committee of the Human Kidney Transplant Registry* 197
Management of Secondary Hyperparathyroidism in Renal Allograft Recipients. *R. E. Wilson, C. L. Hampers, A. I. Katz, D. S. Bernstein, A. Wachman, J. P. Merrill and J. E. Murray* 206
Hepatitis and Liver Damage among Patients and Staff in a Transplantation Unit. *Curt Franksson* 209
Tissue-like Proteins Excreted in Urine From Transplanted Kidneys (Histuria). *Bernard Antoine, Thérese Neveu, Michael Leski and Jean-Francois Bach* 213

SYMPOSIUM ON SPECIAL TOPICS IN ORGAN TRANSPLANTATION

Orthotopic Liver Transplantation in Man. *T. E. Starzl, L. Brettschneider, I. Penn., P. Bell, C. G. Groth, H. Blanchard, N. Kashiwagi and C. W. Putnam* 216
Transplantation of the Lung. *David A. Blumenstock, Henri P. Otte, Oscar B. Grosjean and Martien A. Mulder* 223
Transplantation of the Intestine and Pancreas. *Richard C. Lillehei, Yasuo Idezuki, William D. Kelly, John S. Najarian, Frederick K. Merkel and Frederick C. Goetz* 230
Transplantation of the Spleen. *Erle E. Peacock, Jr., W. P. Webster, G. D. Penick, John W. Madden and Peter Hutchin* 239
Cartilage and Bone Transplantation. *Thomas Gibson* 246
Heterotransplantation. *Keith Reemtsma* 251
Suppression of the Immune Response to Corneal Xenografts. *Robert A. D'Amico, Rudolph Chaunico and Ramon Castroviejo* 256
Neuropathological Investigation of the Transplanted Canine Brain. *Robert J. White, Maurice Albin and David Yashon* 259

SCIENTIFIC FORUM ON ORGAN TRANSPLANTATION—I

Renal Transplants in Children. *G. M. Williams, H. M. Lee and D. M. Hume* .. 262
Intravascular Coagulation (IVC) in Human Renal Allograft Rejection. *G. J. Busch, W. E. Braun, C. B. Carpenter, J. M. Corson, E. R. Galvanek, E. S. Reynolds, J. P. Merrill and G. J. Dammin* 267
Glomerular Ultrastructure and Macromolecular Permeability Following Human Renal Transplantation. *B. Hulme, K. A. Porter and D. A. Ogden* 271
Characterization of Antibodies Following Human Renal Homograft Rejection. *R. T. Rolley, G. M. Williams, R. A. Lerner, G. Hanscom and D. M. Hume* 275

Metabolism of Radiolabelled C'3 and C'4 in Human Renal Allograft Recipients. *Charles B. Carpenter, Shaun Ruddy, Isam H. Shehadeh, John P. Merrill, K. Frank Austen and Hans J. Muller-Eberhard* 279
Non-Specific and Adaptive Immunity in Renal Transplantation. *J. Wesley Alexander, H. V. McCoy, J. P. Phair and W. A. Altemeier* 283
Biopsy Features on Early Acute Rejection in Cadaveric Renal Grafts. *Priscilla Kincaid-Smith, I. F. C. McKenzie, P. J. Morris and V. C. Marshall* 287
Prolonged Renal Allograft Survival Associated with Antigen Pretreatment. *R. E. Wilson, A. Rippen, C. R. Hayes, R. K. Dagher and G. J. Busch* 290
Simultaneous Homotransplantation of Heart and Kidney from the Same Donor in Bilaterally Nephrectomized Dogs. *M. Legrain, Gandjbakhch, M. Dubois, G. Wajcner, J. Rottembourg and D. Guilmet* 293

SCIENTIFIC FORUM ON ORGAN TRANSPLANTATION—II

Studies on the Mechanism of Canine Renal Allograft Rejection. *J. E. Foker, D. S. Clark, R. J. Pickering, R. A. Good and R. L. Varco* 296
Renal Autograft Rejection Initiated by Passive Transfer of Immune Plasma. *Kent C. Cochrum, William C. Davis, Samuel L. Kountz and H. Hugh Fudenberg* 301
The Participation of Platelets in the Rejection of Dog Kidney Allotransplants: Hematologic and Electron Microscopic Studies. *Rosalin Lownhaupt and Paul Nathan* 305
Histopathology of Orthotopic Canine Cardiac Homografts and Its Clinical Correlation. *J. C. Kosek, E. J. Hurley, D. H. Sewell and R. R. Lower* 311
Organ Homografts for Hemophilia. *Thomas L. Marchioro, Cecil Hougie, Haakon Ragde, Robert B. Epstein and E. Donnall Thomas* 316
Immunosuppressive Effects of the Orthotopically Transplanted Porcine Liver. *R. Y. Calne, H. J. O. White, R. M. Binns, B. M. Herbertson, P. R. Millard, J. Pena, J. R. Salaman, J. R. Samuel and D. R. Davis* 321
Functional Adequacy of Transplanted Lungs in the Early Postoperative Period: Definition and Extension of Tolerable Ischemia. *Frank J. Veith, Michael Torres, Spencer Koerner, Abraham Buchberg and Marvin L. Gliedman* 325
In Vitro Interaction of Specifically-Sensitized and Non-Sensitized Lymphocytes with Kidney Cells from Human Renal Homografts. *James S. Wolf, J. C. Fawley and David M. Hume* 328

SCIENTIFIC FORUM ON TRANSPLANTATION GENETICS

The HL-A System Sub-Loci and Their Importance in Transplantation. *Jean Dausset, Roy L. Walford, J. Colombani, L. Legrand, N. Feingold, A. Barge and F. T. Rapaport* 331
Mixed Leukocyte Culture Studies in Families with Known HL-A Genotypes. *F. H. Bach, R. J. Albertini, D. B. Amos, R. Ceppellini, P. L. Mattiuz and V. C. Miggiano* 339
Skin Graft Rejection Between Subjects Genotyped for HL-A. *D. B. Amos, H. F. Seigler, J. G. Southworth and F. E. Ward* 342
Serotyping for Homotransplantation XXV. Evidence for Three HL-A Subloci. *M. R. Mickey, D. P. Singal and P. I. Terasaki* 347

Recombination and Other Chromosomal Aberrations within the HL-A Locus. *F. E. Ward, J. G. Southworth and D. B. Amos* 352
The HL-A System Defined with Lymphocytotoxic and Platelet Antibodies in Relation to Kidney Transplantation. *F. Kissmeyer-Nielsen, A. Svejgaard, and M. Hauge* 357
Histocompatibility Typing of Inbred Mice for Known Non-H-2 Alleles. *Ralph J. Graff and George D. Snell* 362
Histocompatibility Antigens in Wild Mice (Mus musculus). *P. Ivanyi, P. Demant, Marta Vojtiskova and Dagmar Ivanyi* 365

SCIENTIFIC FORUM ON HISTOCOMPATIBILITY TESTING

Nomenclature for Factors of the HL-A System 368
Leukocyte Typing and Kidney Transplantation in Unrelated Donor-Recipient Pairs. A Study in Patients of Drs. S. Peart, J. F. Mowbray and G. R. J. Alexandre. *J. J. van Rood, A. van Leeuwen, R. Pearce and J. A. van der Does* 372
Leukocyte Antigens in Cadaver Transplantation. *Peter J. Morris, Priscilla Kincaid-Smith and Vernon C. Marshall* 376
A Genetic Model of Human Histocompatibility Based on the Results of Double Cadaver Renal Homografts. *J. R. Leo, S. J. Kilpatrick, B. A. de Planque, G. M. Williams and D. M. Hume* 379
Donor Selection for Kidney Transplantation, Based on Leukocyte Pheno- and Genotyping and Mixed Lymphocyte Cultures. *M. Jeannet, V. A. Wonham, H. J. Winn and P. S. Russell* 382
Experimental Allotransplantation in Man: I. The Role of the HL-A System in Different Genetic Combinations. *R. Ceppellini, P. L. Mattiuz, G. Scudeller and M. Visetti* 385
Experimental Allotransplantation in Man: II. The Role of A_1, A_2, and B Antigens; III. Enhancement by Circulating Antibody. *R. Ceppellini, S. Bigliani, E. S. Curtoni and G. Leigheb* 390
Kidney Versus Skin Allograft Reactions in Normal Adult Rats of Inbred Strains. *Edward White and W. H. Hildemann* 395
In Vitro Expression of Homograft Reactions. *Salah Al-Askari and H. L. Lawrence* 400

SCIENTIFIC FORUM ON HETEROLOGOUS ANTISERA—I

A New in Vitro Test Evaluating Anti-Lymphocyte Serum Potency. *Jean-Francois Bach, Mireille Dardenne, Jean Dormont and Bernard Antoine* 403
The Stimulating and Suppressive Properties of Anti-Lymphocyte Serum (ALS) on Lymphocyte Transformation in Vitro. *V. P. Eijsvoogel, M. J. G. J. du Bois, P. Th.A. Schellekens and J. J. van Loghem* 408
Antibody Plaque Reduction in Vitro and in Vivo: A Rapid Assay for Immunosuppressive Agents. *John Gavin, Walter Waterbury and Herman Friedman* 413
Effect of Actinomycin D and Puromycin on the in Vitro Cytotoxic Activity of Lymphocytes. *B. D. Brondz* 416
Inhibition of Cytotoxic Lymphocytes by Anti-Lymphocytic Serum. *G. Holm and P. Perlmann* 420

Effect of Antilymphocyte Serum on the Thymus. *Raphael H. Levey and Robert Taub* 424
Induction of Tolerance with Antilymphocytic Serum. *E. M. Lance and P. B. Medawar* 429
Effects of Antilymphocyte Sera on Antibody Forming Cells and Macrophages in the Early Immune Response. *Rolf F. Barth, Robert L. Hunter and Joanne Southworth* 433
Anti-Leukocyte Serum: Suppression of Antibody-Forming Cells and Their Precursors in Vivo and in Vitro. *Jerry Allen, Herman Friedman and Leony Mills* 436
Thoracic Duct Lymphopenia: An Effect of Antilymphocyte Serum. *Michael C. Gelfand, Roland Girardet and Eli A. Friedman* 439
Local Effects of Antilymphocyte Serum. *Nicholas A. Halasz, Robert Amonic, Joseph Devin and Stephen Miller* 442
Prolongation of Skin Homograft Survival by Mouse-Anti-Mouse Thymocyte Isoantiserum. *R. N. Taub* 445

SCIENTIFIC FORUM ON HETEROLOGOUS ANTISERA—II

A Trial With Heterologos Antilymphocyte Globulin in Man. *T. E. Starzl, L. Brettschneider, I. Penn, R. W. Schmidt, P. Bell, N. Kashiwagi, C. M. Townsend and C. W. Putnam* 448
Studies of Anti-Lymphocyte Globulins Made from Thoracic Duct Lymphocytes. *J. Traeger, M. Carraz, D. Fries, J. Perrin, E. Saubier, J. P. Bernhardt, J. P. Revillard, P. Bonnet, J. P. Archimbaud and J. Brochier* 445
Clinical Use of Antilymphoblast Serum. *J. S. Najarian, F. K. Merkel, G. E. Moore, R. A. Good and J. C. Aust* 460
Mechanism of Long Term Survival of Renal Allografts After Treatment with Antilymphocyte Antibody. *R. D. Guttmann, R. R. Lindquist, S. A. Ockner and J. P. Merrill* 463
The Efficiency of Sheep Antidog Antilymphocyte Serum (SADALS) in the Prolongation of Canine Heart Allografts. *B. Halpern, J. P. Cachera, M. Lacombe, A. Hathaway, Y. Crepin, Bui Mong Hung, J. P. Lacassagne, J. Leandri, M. De Mendoza, D. Laurent and Ch. Dubost* 467
Prolongation of Murine Cardiac Allografts With Antilymphocyte Serum. *K. P. Judd, C. R. Allen, Jr., M. J. Guiberteau and J. J. Trentin* 470
The Effect of Heterologous Antilymphocyte Serum on the Formation of H-2 Antibody and the Induction of Allograft Immunity. *Anthony P. Monaco and Dominique J. Franco* 474

SCIENTIFIC FORUM ON TRANSPLANTATION ANTIGENS

Further Characterization of Soluble Mouse and Human Transplantation Antigens. *J. M. Summerell and D. A. L. Davies* 479
Advances in the Chemistry of Transplantation Antigens. *Barry D. Kahan and R. A. Reisfeld* 483
HL-A Substances: Properties and Immunization of Rabbits. *J. R. Batchelor and A. R. Sanderson* 489

Soluble HL-A Iso-Antigen Preparations. *William Boyle* 491
Solubilization, Properties and Molecular Separation of HL-A Alloantigens. *Dean L. Mann, G. Nicholas Rogentine, John L. Fahey and Stanley G. Nathenson* 494
Induction of the Alloimmune Response in Mouse Lymphocytes By Cell-Free Transplantation Antigens in Vitro: Enhancement of DNA Synthesis and Specific Sensitization. *Lionel A. Manson and Tobianne Simmons* 498
Chemistry of Possible Transplantation Antigens. *Charles F. Lange and A. S. Markowitz* 502

SCIENTIFIC FORUM ON ALPHA GOBULINS AND OTHER SERUM COMPONENTS IN TRANSPLANTATION

Role of Alpha Globulins in Immunosuppression: Reactive Site Occlusion Hypothesis. *Benjamin B. Kamrin* 506
In Vivo Immunosuppression and in Vitro Antiproliferative Activity of Polyribonuclease. *J. D. Milton and J. F. Mowbray* 511
Competitive Blockade of Lymphocyte Stimulation by a Serum Immuno-Regulatory Alpha Globulin (IRA). *S. R. Cooperband, R. C. Davis, K. Schmid and J. A. Mannick* 516
Immunosuppression by Antibody. *R. J. W. Ryder, L. K. Kilham and R. S. Schwartz* 524
Protective Action of Homologous Serum Component on Graft Rejection. *M. Hasek, I. Karakoz, E. Skamene, Jitka Chutna, K. Nouza, J. Bubenik, M. Nemec and Vlasta Sovova* 527
Lymphocyte-Antibody Interactions in Immunological Enhancement. *M. Takasugi and W. H. Hildemann* 530

SCIENTIFIC FORUM ON IMMUNOBIOLOGY—I

Cell to Cell Interaction in the Immune Response. *J. F. A. P. Miller and G. F. Mitchell* 535
Stimulation of Lymphocytes by Direct Exposure to Antigens in Vitro. *J. L. Boak and N. A. Mitchison* 539
Allogeneic Inhibition in Tolerant Animals. *Erna Möller, Wayne Lapp and Leif Lindholm* 543
Genetic Control of the Antibody Response to a Synthetic Polypeptide: Transfer of Response with Spleen Cells or Lymphoid Precursors. *Marvin L. Tyan, Hugh O. McDevitt and Leonard A. Herzenberg* 548
Graft Reaction in Tissue Culture by Normal Rat Lymphocytes. *Haim Ginsburg, Wolfgang Ax and Gideon Berke* 551
Tissue Isoantigens Shared by Rabbits and Mice. *C. John Abeyounis and Felix Milgrom* 556
Maturation of Histocompatibility Antigens and Host Reactivity in the Rat. *Barbara F. Heslop* 560
Antigen-Induced Refractory Period of Adoptive Transfer. *Noel R. Rose and Frank J. Twarog* 564
Specificity of the In Vitro Response of Antigen-Sensitive Units to Two Antigens. *David Osoba* 567

Induction of Tolerance in Adult CAF_1 and New Zealand Mice Following a Single Injection of a Low Dose of Bovine Serum Albumin. *G. A. Theis, G. J. Thorbecke and G. W. Siskind* 571
Allogeneic Suppression: Inhibition of Antibody Plaque Forming Cells in Vitro by Non-sensitized Lymphoid Cells. *Herman Friedman* 574
Serum-Borne Factors in the Immune Elimination of ^{51}Cr-Labelled Allogeneic Lymphoid Cells from Mice. *G. Gowland and D. R. Bainbridge* 577
Specific Suppression of Cell Mediated Immune Response. *Donald A. Rowley, Frank W. Fitch, Tatsuo Saiton and F. P. Stuart* 580
Skin Allograft Survival in Lymphocyte-Depleted Calves. *A. D. Chanana, E. P. Cronkite, D. D. Joel and L. M. Schiffer* 583
Inhibition of Cellular Immunity and Enhancement of Humoral Antibody Formation in Mice Infected with Lactic Dehydrogenase Virus. *Richard J. Howard, Stephen E. Mergenhagen, Abner L. Notkins and Susanne F. Dougherty* 586

SCIENTIFIC FORUM ON IMMUNOBIOLOGY—II

The Effect of Lymph Node Permeability Factor on Renal Allografts in Rats. *C. Casciani and R. Cortesini* 589
Allograft Immunity Produced with Skin Isografts from Immunologically Tolerant Mice. *David Steinmuller* 593
Further Studies of the Hamster's Cheek Pouch as a Privileged Site. *Clyde F. Barker, R. E. Billingham and C. F. Shaffer* 597
Inhibition of Second-Set Renal Allograft Responses by Portal Vein Drainage. *A. Fukuda, T. Hanaoka, A. C. Solowey and F. T. Rapaport* 602
Autoimmune Concomitants of Renal Allografts. *John Klassen and Felix Milgrom* 605
An Experimental Model Relevant to Recurrent Autoimmune Glomerulonephritis in Transplanted Human Kidneys. *Raymond W. Steblay and Ulrich Rudofsky* 609
Thymus: An Essential Factor in Lymphoid Repopulation. *O. Stutman, E. J. Yunis and R. A. Good* 614
Specific Immunosuppression by Minute Doses of Passive Antibody. *G. Haughton and D. R. Nash* 616
Immunological Tolerance to a Purified Protein Antigen in Vitro. *W. D. Armstrong and E. Diener* 619
Immunosuppressive Effects of Phytohemagglutinin. *Gertrude B. Elion, Vincent Blancuzzi and Ernest Zahner* 622
Partial Identification of a Delayed Reaction Effector Substance from Homologous Lymphoid Cell Mixtures. *F. B. Taylor and J. W. Streilein* 624
An Explanation for the Inefficiency of Guinea Pig Complement in The Cytolysis of Sheep Erythrocytes or Rat Mast Cells Sensitized with Rabbit Antiserum: A Double Block. *Raymond A. Kempf, Irma Gigli and K. Frank Austen* 626

SYMPOSIUM ON CURRENT HORIZONS IN TRANSPLANTATION

Studies in Immuno-suppression. Methods to Evaluate Anti-Human Lymphocyte Sera. *H. Balner, H. Dersjant and D. W. van Bekkum* 629

Streptococcal Antigens and Antibodies in Transplantation. *Felix T. Rapaport and A. S. Markowitz* 638
The Immunology of Transplantation. *H. Sherwood Lawrence* 645
Histocompatibility Studies in Haploidentical Genetic Combinations. *Jean Dausset and Felix T. Rapaport* 649
Horizons in Clinical Organ Transplantation. *Paul S. Russell* 659
The Future of Transplantation Biology and Medicine. *Sir Peter Medawar* 666
Transplantation of Organs and Attitudes—The Public's Attitude Toward Clinical Transplantation. *Harold M. Schmeck, Jr.* 670
List of Papers Read by Title 675
Index of Authors 679

No. 2 (June)

Acknowledgments and Support 684
Introductory Remarks, *Frank C. Spencer* 691
A Human Case of Allogeneic Heart Transplantation Compatible in The H-LA System and Treated by a Heterologous Anti-Lymphocyte Globulin, *C. Dubost and J. P. Cachera* 693
Clinical Experience in Transplantation of the Human Heart: Report of Ten Cases, *Denton A. Cooley, James J. Nora, John J. Trentin, Grady L. Hallman, Robert D. Bloodwell and Robert D. Leachman* 703
Structural and Functional Changes in Cardiac Transplants, *Vallee L. Willman and C. Rollins Hanlon* 713
The First Heart Transplant in Man: Historical Reexamination of the 1964 Case in the Light of Current Clinical Experience, *James D. Hardy and Carlos M. Chavez* 717
Clinical and Experimental Observations in Heart Transplantation, *Adrian Kantrowitz, Yasunori Koga, Hans E. Carstensen, Eduard Sujansky, Jordan D. Haller, Joseph S. Krakauer, William Neches and Jacques L. Sherman* 727
Rejection of The Transplanted Heart, *Richard R. Lower* 733
Cardiac Homotransplantation in Man, *Norman E. Shumway, Edward B. Stinson and Eugene Dong, Jr.* 739
Summation—Symposium on Heart Transplantation, *Theodore Cooper* 747
Discussion, *Frank C. Spencer, Theodore Cooper, C. Dubsot, Denton Cooley, C. Rollins Hanlon, James Hardy, Adrian Kantrowitz, Richard R. Lower and Norman E. Shumway* 751
Cardiac Transplantation: Current Status, *Theodore Cooper and Sheila Mitchell* 755
Second Annual Congress of The Transplantation Society: Organization and Contents 759

No. 3 (September)

Foreword. *G. Donald Whedon* 779
Introduction. *Kenneth W. Sell* 780

Organ Preservation in Transplantation. *William M. Abbott and Kenneth W. Sell* 781
Hypothermia and High Pressure Oxygen in Whole Organ Storage. *Leslie E. Rudolf* 795
Kidney Preservation for Transplantation. I. Twelve Hour Storage in Rabbits. *Geoffrey M. Collins, Maria Bravo-Shugarman, Steve Novom and Paul I. Terasaki* 801
Lung, Liver, and Kidney Preservation in Transplantation. *Frank J. Veith, Joseph C. Dougherty, Lari Attai and Marvin L. Gliedman* 808
The Avoidance of Primary Hypoxic Damage During Liver Preservation by Perfusion with Hb-Free Solutions. *W. E. Zimmerman, M. Kessler, G. Lamperle, D. Seitz and R. Dierkesinann* 819
The Effect of Environmental Factors on Electrolyte and Acid-Base Status During Isolated Baboon Kidney Perfusions. *J. N. De Klerk, J. J. W. van Zyl, M. J. Ward, G. S. Johnston, and G. P. Murphy* 825
The Stabilized Autoperfusing Heart-Lung Preparation as a Vehicle for Extracorporeal Preservation. *Francis Robicsek, Wilfred Tam and Harry K. Daugherty* 834
Xenogeneic Storage of Primate Hearts. *E. L. Dupree, Jr., M. Mills R. Clark and K. W. Sell* 840
Radioisotope and Radiocarbon Characterization of Baboon Kidney Function During Bloodless Isolated Perfusion. *G. S. Johnston, P. D. R. van Heerden, J. J. W. van Zyl and G. P. Murphy* 852
Enzyme Levels in the Effluent Perfusates from Frozen Canine Kidneys. *A. A. Beisang, E. F. Graham, R. C. Lillehei, R. H. Dietzman and J. E. Carter* 862
Erythropoietin Release from Preserved Kidneys. *G. P. Murphy, E. A. Mirand, J. H. Groenwald, G. M. Kenny and J. J. W. van Zyl* 882
Directory of Transplantation Society Members 889

No. 4 (December)

Foreword. *Felix T. Rapaport* 924
Chronic Membranoproliferative Glomerulonephritis with Hypocomplementemia. *Alfred F. Michael, Roger C. Herdman, Alfred J. Fish, Richard J. Pickering and Robert L. Vernier* 925
Anti-DNA Antibodies and Renal Lesions of Patients with Systemic Lupus Erythematosus. *D. Koffler, V. Agnello, R. I. Carr and H. G. Kunkel* 933
IgA Glomerular Deposits in Renal Disease. *Jean Berger* 939
Virus-induced Immune-complex-type Glomerulonephritis. *Frank J. Dixon, Michael B. A. Oldstone and Giorgio Tonietti* 945
Mediation of Immunologic Glomerular Injury. *Charles G. Cochrane* 949
Chemistry of Cross-reactive Fragments of Streptococcal Cell Membrane and Human Glomerular Basement Membrane. *Charles F. Lange* 959
Basement Membrane Antigens in Serum and Urine. *John J. McPhaul, Jr., and Frank J. Dixon* 964
The Relationship of Streptococcal Cross-reactive Antigens to Rheumatic Fever. *John B. Zabriskie* 968

Cross-reaction of Group A Streptococci and Heart Tissue: Varying Serologic Specificity of Cross-reactive Antisera and Relation to Carrier-Hapten Specificity. *Melvin H. Kaplan* 976
Induction of Renal Disease with Antisera to Group A Streptococcal Membranes. *F. T. Rapaport, A. S. Markowitz, R. T. McCluskey, T. Hanaoka and T. Shimada* 981
Streptococcal-related Glomerulonephritis in the Rhesus Monkey. *A. S. Markowitz* 985
Experimental Streptococcal Infections in Baboons. *A. Taranta, M. Spagnuolo, M. Davidson, G. Goldstein and J. W. Uhr* 992
Glomerulonephritis in Renal Transplants. *John P. Merrill* 994
Discussion of Recurrent Glomerulonephritis. *John J. McPhaul, Jr.* 1005
Antilymphocyte Globulins in Kidney Transplantation: Effects on Glomerular Disease. *J. Traeger, D. Fries, J. P. Revillard, J. Brochier and N. Brunat-Blanc* 1006
Role of Humoral Antibodies in Rejection of Renal Allografts. *F. Milgrom, K. Kano and J. Klassen* 1013
Interpretations of Transplanted Kidney Morphology. *John S. Najarian and John E. Foker* 1022
Summation of the Conference. *Maclyn McCarty* 1032

Index of Authors

Abbott, W. M., 781
Abeyounis, C. J., 556
Ackermann, J. R. W., 153
Agnello, V., 933
Albertini, R. J., 339
Albin, M., 259
Al-Askari, S., 400
Alexander, J. W., 283
Allen, Jr., C. R., 470
Allen, J., 436
Altemeier, W. A., 283
Amiel, J. L., 16
Amonic, R., 442
Amos, D. B., 339, 342, 352
Anderson, J. M., 67
Ankerst, J., 95
Antoine, B., 213, 403
Archimbaud, J. P., 455
Armstrong, W. D., 619
Attai, L., 808
Aust, J. C., 460
Austen, K. F., 279, 626
Avery, G. B., 61
Ax, W., 551

Bach, F. H., 339
Bach, J., 213, 403
Bailey, G. L., 124
Bainbridge, D. R., 577
Balner, H., 25, 629
Barge, A., 331
Barker, C. F., 597
Barnes, B. A., 197
Barth, R. F., 433
Batchelor, J. R., 489
Beaudoin, J. G., 147
Bebenik, J., 527
Beisang, A. A., 862
Bell, P., 216, 448
Bell, P. R. F., 132
Berger, J., 939
Berke, G., 551
Bernhardt, J. P., 455
Bernstein, D. S., 206
Bigliani, S., 390
Billingham, R. E., 3, 597
Binns, R. M., 321
Blanchard, H., 216
Blancuzzi, V., 622
Bloodwell, R. D., 703
Blumenstock, D. A., 223
Boak, J. L., 539
Bonnet, P., 455
Boyle, W., 491
Braun, W. E., 267
Bravo-Shugarman, M., 801
Brettschneider, L., 106, 132, 216, 448
Breyere, E. J., 71
Brochier, J., 455, 1006
Brondz, B. D., 416
Brunatblanc, N., 1006
Buchberg, A., 325
Busch, G. J., 267, 290

Cachera, J. P., 467, 693
Calne, R. Y., 321
Carpenter, C. B., 267, 279
Carr, R. I., 933
Carraz, M., 455
Carstensen, H. E., 727
Carter, J. E., 862
Casciani, C., 589
Castroviejo, R., 256
Cattan, A., 16
Ceppellini, R., 339, 385, 390
Chanana, A. D., 583
Chandrasaderam, A. K., 147
Chaunico, R., 256
Chavez, C. M., 717
Chochrane, C. G., 949
Chutna, J., 527
Clark, D. S., 296
Clark, M. M. R., 840
Cochrum, K. C., 301
Coetz, F. C., 230
Collins, G. M., 801
Colombani, J., 331
Congdon, C. C., 34
Converse, J. M., 14
Cooley, D. A., 703, 751
Cooper, T., 747, 751, 755
Cooperband, S. R., 516
Corson, J. M., 267
Cortesini, R., 589
Curtoni, E. S., 390
Crepin, Y., 467
Cronkite, E. P., 583

Dagher, R. K., 290
D'Amico, R. A., 256
Dammin, G. J., 267
Dardenne, M., 403
Daugherty, H. K., 834
Davidson, M., 992
Davies, D. A. L., 479
Davies, R. C., 516
Davis, D. R., 321
Davis, W. C., 301
Dausset, J., 331, 649
Defendi, V., 119
De Klerk, J. N., 825
Demant, P., 365
de Mendoza, M., 467
Demers, R., 147
de Planque, B. A., 379
Dersjant, H., 629
Devin, J., 442
Dicke, K. A., 25
Diener, E., 619
Dierkesinann, R., 819
Dietzman, R. H., 862
Dixon, F. J., 194, 945, 964
Dong, Jr., E., 739
Dormont, J., 403
Dougherty, J. C., 808
Dougherty, S. F., 586
Dubois, M., 293
du Bois, M. J. G. J., 408
Dubost, Ch., 467
Dubost, C., 693, 751
Dupree, Jr., E. L., 840

Eijsvoogel, V. P., 408
Elion, G. B., 622
Epstein, R. B., 31, 316

Fahey, J. L., 494
Fawley, J. C., 328
Feemster, J. A., 138
Feffer, A., 90
Feingold, N., 331
Fish, A. J., 925
Fitch, F. W., 580
Foker, J. E., 184, 296, 1022
Franco, D. J., 474
Franksson, C., 209
Freidman, H., 413
Friedman, E. A., 439
Friedman, H., 436, 574
Fries, D., 455, 1006
Fudenberg, H. H., 301
Fukuda, A., 602

Galvanek, E. R., 267
Gandjbakhch, 293
Gavin, J., 413
Gelfand, M. C., 439
Gengozian, N., 34

Gibson, T., 246
Gigli, I., 626
Ginsburg, H., 551
Girardet, R., 439
Gliedman, M. L., 325, 808
Goldstein, G., 992
Good, R. A., 296, 460, 614
Gowland, G., 577
Gradman, W. S., 153
Graff, R. J., 362
Graham, E. F., 862
Groenwald, J. H., 882
Grosjean, O. B., 223
Groth, C. G., 216
Guiberteau, M. J., 470
Guilmet, D., 293
Guttmann, R. D., 463

Hager, E. B., 124
Halasz, N. A., 442
Haller, J. D., 727
Hallman, G. L., 703
Halpern, B., 467
Hamburger, J., 160
Hammond, W., 106
Hampers, C. L., 124, 206
Hanaoka, T., 602, 9081
Hanlon, C. R., 713, 751
Hanscom, G., 275
Hardy, J. D., 717, 751
Harris, R., 122
Hasek, M., 527
Hauge, M., 76, 357
Haughton, G., 616
Hathaway, A., 467
Hayes, C. R., 290
Hayry, P., 119
Hellström, I., 90
Hellström, K. E., 90
Herbertson, B. M., 321
Herdman, R. C., 925
Herzenberg, L. A., 548
Heslop, B. F., 560
Hildemann, W. H., 395, 530
Holm, G., 420
Hopkinson, W. I., 153
Hougie, C., 316
Howard, R. J., 586
Hrask, Y., 16
Hulme, B., 271
Hume, D. M., 171, 262, 275, 328, 379
Hung, B. M., 467
Hunt, C. V., 61
Hunter, R. L., 433
Hurley, E. J., 311
Hutchin, P., 239

Idezuki, Y., 230
Ivanyi, D., 365
Ivanyi, P., 80, 365

Jakoubkova, J., 80
Jeannet, M., 382
Joel, D. D., 583
Johnston, G. S., 825, 852
Judd, K. P., 470

Kahan, B. D., 483
Kamrin, B. B., 506
Kano, K., 1013
Kantrowitz, A., 727, 751
Kaplan, M. H., 976
Karakoz, I., 527
Kashiwagi, N., 216, 448
Katz, A. I., 206
Kelly, W. D., 230
Kempf, R. A., 626
Kenny, G. M., 882
Kessler, M., 819
Kilham, L. K., 524
Kilpatrick, S. J., 379
Kincaid-Smith, P., 287, 376
Kirby, D. R. S., 53
Kissmeyer-Nielsen, F., 76, 357
Klassen, J., 605, 1013
Koerner, S., 325
Koffler, D., 933
Koga, Y., 727
Koldovsky, P., 80
Kosek, J. C., 311
Kountz, S. L., 301
Krakauer, J. S., 727
Kunkel, H. G., 933

Lacassagne, J. P., 467
Lacombe, M., 467
Lamperle, G., 819
Lance, E. M., 429
Lange, C. F., 502, 959
Lapp, W., 543
Laurent, D., 467
Lawrence, H. S., 400, 645
Leachman, R. D., 703
Leandri, J., 467
Lee, H. M., 262
Legrain, M., 293
Legrand, L., 331
Leigheb, G., 390
Leo, J., 171
Leo, J. R., 379
Lerner, R. A., 194, 275
Leski, M., 213
Levey, R. H., 424
Lillehei, R. C., 138, 230, 862

Lilly, F., 85
Lindholm, L., 543
Lindquist, R. R., 463
Lowenhaupt, R., 305
Lower, R. R., 311, 733, 751

MacLean, L. D., 147
Madden, J. W., 239
Malave, G., 147
Mann, D. L., 494
Mannick, J. A., 516
Manson, L. A., 498
Marchioro, T. L., 316
Markowitz, A. S., 502, 638, 981, 985
Marshall, V. C., 287, 376
Martin, Jr., A. J., 132
Mathé, G., 16, 113
Mattiuz, P. L., 339, 385
McCarty, M., 1032
McCluskey, R. T., 981
McCoy, H. V., 283
McDevitt, H. O., 548
McKenzie, I. F. C., 287
McPhaul, J. J., 194, 964, 1005
Medawar, P., 666
Medawar, P. B., 429
Mergenhagen, S. E., 586
Merkel, F. K., 230, 460
Merrill, J. P., 124, 162, 206, 267, 279, 463, 994
Michael, A. F., 925
Mickey, M. R., 347
Miggiano, V. C., 339
Milgrom, F., 556, 605, 1013
Millard, P. R., 321
Miller, J. F. A. P., 535
Miller, S., 442
Mills, L., 436
Milton, J. D., 511
Mirand, E. A., 882
Mitchell, G. F., 535
Mitchell, S., 755
Mitchison, N. A., 539
Mogensen, B., 76
Möller, E., 543
Monaco, A., 474
Moore, G. E., 460
Morris, P. J., 287, 376
Mowbray, J. F., 511
Mulder, M. A., 223
Muller-Eberhard, H. J., 279
Murphy, G. P., 825, 852, 882
Murray, J. E., 206

Najarian, J. S., 184, 230, 460, 1022

Nash, D. R., 616
Nathan, P., 305
Nathenson, S. G., 85, 494
Neches, W., 727
Nemec, M., 527
Neveu, T., 213
Nora, J. J., 703
Notkins, A. L., 586
Nouza, K., 16, 527
Novom, S., 801

Ockner, S. A., 463
Ogden, D. A., 271
Oldstone, M. B. A., 945
Osoba, D., 567
Ostrowski, K., 126
Otte, H. P., 223
Owens, Jr., A. H., 44

Palm, J., 82
Peacock, Jr., E. E., 239
Pearce, R., 372
Pena, J., 321
Penick, G. D., 239
Penn, I., 106, 216, 448
Perlmann, P., 420
Perrin, J., 455
Phair, J. P., 283
Pickering, R. J., 296, 925
Pierce, G. E., 90
Porter, K. A., 271
Putnam, C. W., 216, 448

Radge, H., 316
Rapaport, F. T., 14, 331, 602, 638, 649
Reemtsma, K., 251
Reisfeld, R. A., 483
Revillard, J. P., 455, 1006
Reynolds, E. S., 267
Rippen, A., 290
Robicsek, F., 834
Rogentine, G. N., 494
Rolley, R. T., 171, 275
Rose, N. R., 564
Rottembourg, J., 293
Rowley, D. A., 580
Ruddy, S., 279
Rudofsky, T., 609
Rudolf, L. E., 795
Rudolph, R. H., 31
Russell, P. S., 382, 659
Ryder, R. J. W., 524

Saitoh, T., 580
Salaman, J. R., 321
Samuel, J. R., 321
Sanderson, A. R., 489
Santos, G. W., 44
Saubier, E., 455
Schellekens, P. Th.A., 408
Schiffer, L. M., 583
Schlumberger, J R., 16
Schmeck, Jr., H. M., 670
Schmid, K., 516
Schmidt, R. W., 448
Schneid, V., 80
Schneider, M., 16
Schwartz, R. S., 524
Schwarzenberg, L., 16
Schudeller, G., 385
Seigler, H. F., 342
Seitz, D., 819
Sell, K. W., 780, 781, 840
Sewell, D. H., 311
Shaffer, C. F., 597
Shehadeh, I. H., 279
Sherman, J. L., 727
Shimada, T., 981
Shumway, N. E., 739, 751
Simmons, R. L., 47
Simmons, T., 498
Singal, D. P., 347
Siskind, G. W., 571
Sjogren, H. O., 95
Skamene, E., 527
Slapak, M., 147
Snell, G. D., 362
Solowey, A. C., 602
Southworth, J., 433
Southworth, J. G., 342, 352
Sovova, V., 527
Spagnuolo, M., 992
Spencer, F. C., 691, 751
Sprenger, W. W., 71
Starr, J. S., 132
Starzl, T. E., 106, 132, 216, 448
Steblay, R. W., 609
Steinmuller, D., 593
Stinson, E. B., 739
Storb, R., 31
Streilein, J. W., 624
Stuart, F. P., 580
Stutman, O., 614
Sujansky, E., 727
Summerell, J. M., 479
Svejgaard, A., 357

Takasugi, M., 530
Tam. W., 834
Taranta, A., 992
Taub, R., 424
Taub, R. N., 445
Taylor, F. B., 624
Taylor, P. D., 132
Terasaki, P. I., 347, 801
Theis, G. A., 571
Thomas, E. D., 31, 316
Thorbecke, G. J., 571
Timson, J., 122
Tonietti, G., 945
Torres, M., 325
Townsend, C. M., 448
Traeger, J., 455, 1006
Trentin, J. J., 470, 703
Twarog, F. J., 564
Tyan, M. L., 548

Uhr, J. W., 992
Uphoff, D. E., 39

Varco, R. L., 296
Veith, F. J., 325, 808
Vernier, R. L., 925
Visetti, M., 385
Vojtiskova, M., 365
van Bekkum, D. W., 25, 629
Vandeputte, M., 100
van der Does, J. A., 372
van Heerden, P. D. R., 852
van Leeuwen, A., 372
van Loghem, J. J., 408
van Putten, L. M., 25
van Rood, J. J., 372
van Zyl, J. J. W., 825, 852, 882

Wachman, A., 206
Wajener, G., 293
Walford, R. L., 331
Walsh, A., 178
Ward, F. E., 342, 352
Ward, M. J., 825
Waterbury, W., 413
Webster, W. P., 239
Wentzel, J., 122
Whedon, G. D., 779
Willman, V. L., 713
White, E., 395
White, H. J. O., 321
White, R. J., 259
Wigmore, R. A., 147
Williams, G. M., 171, 262, 275, 379
Wilson, R. E., 206, 290
Winn, H. J., 382
Wolf, J. S., 328
Wonham, V. A., 382

Yashon, D., 259
Yunis, E. J., 614

Zabriskie, J. B., 968
Zahner, E., 622
Zavadil, M., 80
Zimmerman, W. E., 819

Index of Subjects

ABO system
  anti-A immunization affecting skin grafts, 390-394
  and heart transplantation, 694, 705
  and HL-A antigens, 342, 372, 385, 390
  See also HL-A system
Acid base status, in perfused kidney, 825-833
Actinomycin D, affecting cytotoxic activity of lymphocytes, 416-419
Adenovirus, antisera against, cytotoxicity of, 95-99
Adoptive transfer, antigen affecting, 564-566
Adrenal cortical tissue grafts, 668
Ag-B antigens
  excess heterozygotes for, and maternal genotype, 82-84
  maturation of, and host reactivity, 560-563
Albumin, bovine serum, tolerance to low doses of, 571-572
Allogeneic inhibition, 574-576
  in tolerant animals, 543-546
Allogeneic lymphoid cells, serum factors in elimination of, 577-579
Alpha globulins
  affecting cells after PHA stimulation, 516-523
  affecting surface membrane of immunocompetent cells, 509-510
  and ribonuclease activity, 516-523
  and tolerance to parabiosis, 506-510
Amethopterin, affecting formation of antibody plaque-forming cells, 413-414
Amino acids
  in glomerular basement membrane, 1033
  in transplantation antigens, 485, 487, 495, 502
Antibodies
  adoptive transfer of, antigen affecting, 564-566
  anti-GBM, 275, 277, 647, 662, 949-957, 1033
  circulating, affecting skin grafts, 390-394, 400-401
  combined with antigen, to suppress graft rejection, 580-581
  to DNA, in systemic lupus erythematosus, 933-937, 1032
  immunosuppressive, 524-526, 616-618
  lactic dehydrogenase virus affecting formation of, 586-588
  passive, immunosuppression by, 616-618
  tissue specific, 661-662
Antibody plaque-forming cells. *See* Plaque-forming cells
Antigen-antibody complexes, to suppress graft rejection, 580-581
Antigens, transplantation, 479-505
  amino acid composition of, 485, 487, 495, 502
  carbohydrates in, 502
  cell-free, and alloimmune response in lymphocytes, 498-501
  chemistry of, 483-487, 502-505
  molecular weight of, 485, 487
  properties of, 646
  See also Ag-B; H-2; HL-A
Antihemophilic factor, sources of, 316-320
Anti-L-cell factor, 556-558
Antilymphocyte globulin or serum
  advantages of, 646
  affecting cells in early immune response, 433-434
  affecting chimerism, 34-38
  affecting formation of antibody plaque-forming cells, 414, 433-434, 436-438
  affecting H-2 antibody titers, 474-478
  affecting lymphocyte transformation in vitro, 408-412
  affecting platelets, 452, 457
  affecting precursors of antibody-forming cells, 436-438
  affecting splenic macrophages, 433-434
  affecting thymus, 424-427
  azathioprine with, 448-453, 460, 468
  from cultured lymphocytes, 460-462
  evaluation of, 629-636
  in heart transplantation, 693-702, 708
    in dogs, 467-469
    in mice, 470-473
  inhibiting cytotoxicity of lymphocytes, 420-423
  in kidney transplantation, 177, 283-286, 403, 448-453, 455-459, 463-465, 1006-1011
    from cadaver donors, 450
    from related living donors, 448-450
  local effects of, 442-444
  mode of action of, 667-668
  mouse-anti-mouse isoantiserum, 445-446
  nephrotoxicity of, 1006-1011
  and polyoma oncogenesis, 100-104
  prednisone with, 448-453, 460
  rabbit-anti-mouse serum, 470-473, 474-478

Antilymphocyte serum—(*Continued*)
sheep antidog serum, 467-469
side effects of, 448, 456, 461
and skin graft survival, 403, 442-444, 456, 474-478
in second grafts, 474-478
tests to evaluate potency of, 403-407
from thoracic duct lymphocytes, 455-459
thoracic duct lymphopenia from, 439-441
thrombocytopenia from, 452
tolerance induced by, 429-432
trials in man, 448-453
Antisera
adenovirus, cytotoxicity of, 95-99
heterologous, 403-479
passive transfer of, effects of, 661
See also Humoral factors
to streptococcal membrane, kidney perfused with, 981-984
Attitudes of laymen toward transplantation, 670-674
Autoantibodies, after renal allografts, 605-607
Azathioprine
and antilymphocyte globulin therapy, 448-453, 460, 468
after heart transplantation, 700, 708
and renal graft survival, 283-286

Bacterial endotoxins, producing immunity to Ehrlich ascites carcinoma, 124-125
Basement membrane antigens, in serum and urine, 964-967, 1033
See also Glomerular basement membrane
Biology. *See* Immunobiology
Biopsy features, of early acute rejection of renal grafts, 287-289
Blood, extracorporeal irradiation of, affecting skin graft, 583-584
Blood groups. *See* ABO system
Bone allografts, 248-249
Bone marrow. *See* Marrow
Brain death, diagnosis of, 749
Brain transplantation, 259-261
Carbohydrates, in transplantation antigens, 502

Carcinogens, chemical, skin neoantigens induced by, 113-118
Cartilage transplantation, 246-248
Cell to cell interaction, in immune response, 535-538
Cell-mediated immune responses, 301
specific suppression of, 580-581
Cellular immunity
affected by lactic dehydrogenase virus infection, 586-588
in homograft reactions, 400-401
relationship to humoral immunity, 591-592
Chimerism
antilymphocyte serum affecting, 34-38
cyclophosphamide affecting, 44-45
Choriocarcinoma, and HL-A antigens, 76-81
Chromosomal aberrations, in HL-A locus, 352-356
Circulating antibody, affecting skin grafts, 390-394, 400-401
Coagulation, intravascular, and renal allograft rejection, 177, 267-270, 661, 1024
Complement
deposition in kidney
in systemic lupus erythematosus, 934
in transplants, 1022, 1032
in experimental immunologic glomerulitis, 949-957, 1033
low levels with chronic membranoproliferative glomerulonephritis, 925-931
metabolism of components, after renal transplants, 279-281, 296-299
rabbit and guinea pig components, 626-628
Corneal xenografts, 256-257
Cortisone, affecting formation of antibody plaque-forming cells, 413-414
Cross-reacting antigens, and streptococcal infections, 638-644, 1033
See also Streptococcal cross-reactive antigens
Cyclophosphamide
affecting formation of antibody plaque-forming cells, 413-414
and marrow transplants, 44-45
Cytotoxic activity of lymphocytes
actinomycin D and puromycin affecting, 416-419
affecting kidney cells, 328-330
antilymphocytic serum affecting, 420-423
mouse-anti-mouse isoantiserum affecting, 445-446
Cytotoxicity
of adenovirus antisera, 95-99
contact-induced, 543-546
typing for. *See* HL-A system
Cytotoxins, in hyperimmune sera, 528

Death, definition of, 749
Delayed hypersensitivity
in homograft reaction, 591-592
specific suppression of, 580-581
Digitalis, after heart transplantation, 753
DNA
antibodies in systemic lupus erythematosus, 933-937, 1032

DNA—(*Continued*)
synthesis in mixed cultures of lymphocytes, 498-501
Donor organs, supply of, 664, 748
Down's syndrome, HL-A leukocyte system in, 122-123

Ehrlich ascites carcinoma, bacterial endotoxins producing immunity to, 124-125
Electrocardiography, after heart transplantations, 695, 709, 733-734, 753
Endocrine grafts, 668
Endotoxins, bacterial, producing immunity to Ehrlich ascites carcinoma, 124-125
Enhancement
in transplant reactions, from passive transfer of antiserum, 661
of tumor growth, after antiserum, 530-534
Enzyme studies
of effluent perfusates from frozen kidneys, 862-880
of glomerular basement membrane, 1033
in heart transplantations, 695-698, 709, 735, 753
in immunologic glomerular injury, 957
Erythropoietin release, from preserved kidneys, 882-888
Extracorporeal irradiation of blood, affecting skin grafts, 583-584

Factor VIII, sources of, 316-320
Fetus as allograft, 47-51, 71-74
Fibrin deposition, in renal transplants, 1024
5-Fluorouracil, affecting formation of antibody plaque-forming cells, 413-414
FMR antigen studies, 85-88
Freezing, for organ preservation, 783-784
Friend leukemia virus, 85-88
Future of transplantation biology, 666-669

Genetics
and antibody response, 548-550
haploidentical combination, 649-657
and survival of transplants, 171-172, 645
of transplantation, 331-367
See also HL-A system
Globulins. *See* Alpha globulin; Immunoglobulins
Glomerular basement membrane
anti-GBM antibodies, 275, 277, 647, 662, 949-957, 1033
antigens in serum and urine, 964-967, 1033
changes after renal transplants, 271-273, 647, 1025
chemistry of, 959-962, 1033
cross-reactive fragments from, 959-962, 1033
immune complexes localized on, in SLE, 935, 1032
Glomerulonephritis
chronic membranoproliferative, with hypocomplementemia, 925-931
experimental, in baboons, 992-993
immune complex type, virus-induced, 945-947, 1032-1033
mediation systems in, 949-957, 1033
post-streptococcal, in monkey, 985-991
recurrence in renal transplants, 177, 194-196, 264-265, 609-613, 981, 994-1005, 1035
in allografts and isografts, 996
streptococcal cross-reactive antigens in, 959-962, 1033
Graft reaction in tissue culture, 551-555
Growth
retardation of, after transplants, 659
of transplanted heart, 468-469

Hamster cheek pouch, skin homografts in, 597-601
Haploidentical genetic combinations, 649-657
Hapten-protein antigen, lymphocyte response to, 539-542
H-2 system, 352
antilymphocyte serum affecting, 474-478
non-H-2 alleles, 362-364
properties of, 479-482
and rabbit tissue isoantigens, 556-558
Heart tissue, cross-reaction with streptococcal antigens, 976-979, 1034
Heart transplantation
and anoxia during operation, 713, 752
antilymphocyte globulin in, 693-702, 708
in dogs, 467-469
in mice, 470-473
canine, histopathology of, 311-314
delayed transplants, 728-729
and diagnosis of brain death, 749
and digitalis use, 753
electrocardiography after, 695, 709, 733-734, 753
first experience in man, 717-724
growth of heart after, 468-469
histocompatibility in, 694, 705, 736, 752
immunosuppressive therapy in, 700-701, 705-709, 753
kidney transplant with, 293-295
long-term study and care of patients, 698-700
preservation of donor organ, 138-146, 147-151, 798, 834-838, 840-851

Heart transplantation—(*Continued*)
rejection of, 733-737
acute, 733-735
chronic, 735-736, 753
detection of, 695-698, 709, 753
reports of cases
in California, 739-744
in France, 693-702
in New York, 727-732
in Texas, 703-712
selection of patients for, 748, 751
serum enzyme activity after, 695-698, 709, 735, 753
structural and functional changes in, 713-715
supply of donors for, 748
xenografts, 753

Hemophilia, organ homografts for, 316-320

Hepatitis, in renal transplant patients, 209-211

Heterotransplantation, 251-254, 668
corneal, 256-257

Histocompatibility testing, 368-402, 645, 660-661
and heart transplantation, 694, 705, 736, 752
and kidney transplantation, 171-172, 659
for non-H-2 alleles, 362-364
See also Ag-B; H-2; HL-A

Histuria, in renal transplant patients, 213-215

HL-A system
and ABO system, 342, 372, 385, 390
and choriocarcinoma, 76-81
chromosomal aberrations in, 352-356
in Down's syndrome, 122-123
and genetics of mixed leukocyte cultures, 339-341
and heart transplantation, 694
and kidney transplantation, 172, 275, 357-360, 372- 384
from cadaver donors, 376-381
molecular forms of, 495-497
nomenclature for factors of, 368-372
properties of, 479-482, 489-490
relative potency of individual components of, 649-657
and skin grafts, 342-345, 385-394, 649-657
soluble preparations, 491-493, 494-495
sub-loci of, 331-338, 347-350

Humoral factors
circulating antibody affecting skin grafts, 390-394, 400-401
in renal graft failure, 301-303, 661, 981, 1013-1020, 1022, 1035

Humoral immunity
lactic dehydrogenase virus infection affecting, 586-588
relationship to cellular immunity, 591-592

Hyperbaric pressure for organ preservation, 783, 795-796
for heart, 138-146
for lungs, 808-809, 812-816

Hyperimmune serum
affecting graft rejection, 527-529
affecting tumor growth, 530-534
suppressive effect of, 616-617

Hyperparathyroidism, in renal transplant patients, 179, 206-208

Hypothermia, for organ preservation, 781-783, 795-796, 817
See also Preservation of organs

Immunobiology, 535-628
allogeneic inhibition, 543-546, 574-576
antigen affecting adoptive transfer, 564-566
autoimmune concomitants of renal allografts, 605-607
autoimmune glomerulonephritis in transplanted kidneys, 609-613
cell to cell interactions, 535-538
complement components in rabbit and guinea pig, 626-628
extracorporeal irradiation of blood affecting skin graft survival, 583-584
future of, 666-669
genetic control of antibody response, 548-550
graft reaction in tissue culture, 551-555
hamster cheek pouch studies, 597-601
histocompatibility antigens in rat, 560-563
inflammatory reaction to protein from lymphoid cells, 624-625
inhibition of plaque-forming cells by lymphoid cells, 574-576
lactic dehydrogenase virus affecting antibody formation, 586-588
lymph node permeability factor affecting renal allografts, 589-592
portal vein drainage affecting second-set renal transplants, 602-604
response of lymphocytes to protein antigen, 539-542
response of single precursor to two antigens, 567-569
serum factors in elimination of allogeneic lymphoid cells, 577-579
skin isografts producing allograft immunity, 593-596
specific immunologic suppression, 580-581

Immunobiology—(*Continued*)
suppressive effect of minute doses of passive antibody, 616-618
suppressive effect of phytohemagglutinin, 622-623
thymus affecting lymphoid repopulation, 614-615
tissue isoantigens shared by rabbits and mice, 556-558
tolerance to low doses of bovine serum albumin, 571-572
tolerance to purified protein antigen, 619-621
Immunoglobulins
affecting graft rejection, 527-529
affecting tumor growth, 530-534
depositions on kidney
in lupus erythematosus, 934-937, 941
in renal diseases, 934-937, 939-944, 945, 982, 989, 1032
in renal grafts, 994, 1022
Immunosuppressive antibody, 524-526, 616-618
Immunosuppressive therapy
affecting formation of antibody plaque-forming cells, 413-414
complications with, 645
after heart transplantation, 700-701, 705-709, 753
tumor growth after, 660
Inertia, immunological, of viviparity, 67-70
Infections after transplantations, 659
Inflammatory reaction, to protein from lymphoid cells, 624-625
Intestinal transplantation, 230-232
Ischemia
affecting transplanted lungs, 325-327
lung tolerance for, 816

Kidney
immunoglobulin depositions in
glomerular, 939-944, 945, 982, 989, 1032
in grafts, 994, 1022
in lupus erythematosus, 934-937, 941
mesangial, 934, 941-943, 945, 982, 989
lesions in SLE patients, 933-937
perfused with streptococcal membrane antiserum, 981-984
transplantations, 160-215
acute rejection of, 996
biopsy features of, 287-289
morphology of, 1023-1024
analysis of early failure data, 197-205
anesthesia for, 179-180
antibody and antigen to suppress rejection of, 580-581
and anti-GBM antibodies, 275, 277, 647, 662, 949-957, 1033
antilymphocyte serum in, 177, 283-286, 403, 448-453, 463-465, 1006-1011
from thoracic duct lymphocytes, 455-459
autoimmune concomitants of, 605-607
from cadaver donors, 171-177, 659, 664
antilymphocyte globulin affecting, 450
in children, 262-266
chronic rejection of, 996
morphology of, 1028-1029
and cytotoxic activity of lymphocytes, 328-330
detection of rejection of, 1029-1030
dialysis with, 178-179
endothelial cells in, 1027
genetic factors in, 171-172, 645
glomerular changes after, 177, 271-273, 647, 1025-1026
and glomerulonephritis recurrence, 194-196, 264-265, 609-613, 981, 994-1005, 1035
See also Glomerulonephritis
heart transplant with, 293-295
hepatitis and liver damage in, 209-211
heterotransplants, 252-253
histuria after, 213-215
and HL-A types, 172, 275, 357-360, 372-384
humoral factors in rejection of, 301-303, 661, 981, 1013-1020, 1022, 1035
hyperacute rejection of, 173-175, 267-270, 287-289, 449, 983-984, 996-999, 1014-1015, 1019, 1024, 1035
and hyperparathyroidism, 179, 206-208
immunological principles in, 647
interstitial changes in, 1028
intravascular coagulation affecting, 177, 267-270, 661, 1024
lymph node permeability factor affecting, 589-592
lymphocyte infiltrations in, 296-299, 302
lymphomas after, 106-111
medical problems of, 162-170
mesangial cells in, 1026
and metabolism of complement components, 279-281, 296-299
morphological responses in, 1022-1030, 1034-1035
nephrotic syndrome after, 1001, 1029
nonspecific and adaptive immunity in, 283-286
platelet role in, 305-310, 661, 1024
portal vein drainage affecting, 602-604
practical problems in, 178-183

Kidney, transplantations—(*Continued*)
preservation of donor organ, 153-159, 797, 801-807, 810-812, 814, 817, 825-832
and acid-base status, 825-833
enzyme levels in effluent perfusates from, 862-880
erythropoietin release from, 882-888
radioisotope assessment of function, 852-861
prolonged survival with antigen pretreatment, 290-292
rejection of allograft, 184-191
in canines, 296-299
serum antibodies after, 275-278, 647, 661
related living donors for, 171-177, 660
antilymphocyte globulin affecting, 448-450
retransplantation, 173-175
survival compared with skin allograft survival, 395-399
tubule cells in, 1026-1027
two transplants from single donor, 379-381
ureteral management in, 180-182
Kinin-forming system, in immunologic glomerular injury, 957, 1033

L-cell fibroblasts, serological activity against, 556-558
Lactic dehydrogenase virus, affecting antibody formation, 586-588
Leukemia, viral
FMR antigen studies, 85-88
and new antigenicity of skin, 113-118
Leukocytes
mixed cultures of
DNA synthesis in, 498-501
genetics of, 339-341
as passenger cells in transplanted tissue, 593-596
polymorphonuclear, in renal transplants, 1014, 1022
See also HL-A system; Lymphocytes
Lipoproteins, microsomal, immune response to, 498-501
Liver
damage in renal transplant patients, 209-211
as source of factor VIII, 316-320
transplantations of
antilymphocyte globulin affecting, 448-453
orthotopic, 216-222
porcine allografts, 321-324
preservation of donor organ, 132-136, 798, 809-810, 814, 817, 819-823
retransplantation, 222
Lung transplantation, 223-228
ischemic periods affecting, 325-327
preservation of donor organ, 797, 808-809, 812-816
Lupus erythematosus, systemic, renal lesions in, 933-937
Lymph node permeability factor, affecting renal allografts, 589-592
Lymphocytes
alloimmune response to cell-free antigen particulates, 498-501
cytotoxic activity of
actinomycin D and puromycin affecting, 416-419
antilymphocytic serum affecting, 420-423
on kidney cells, 328-330
mouse-anti-mouse isoantiserum affecting, 445-446
infiltrating renal allografts, 296-299, 302
iso-antibodies to, after renal transplant rejection, 275-278
PHA-stimulated
alpha globulin affecting, 516-523
cytotoxic to target cells, 545-546
polyribonuclease affecting, 511-514
target cell destruction by, 400-401, 545-546
See also Antilymphocyte serum; Leukocytes
Lymphocytopenia
and skin graft survival, 583-584
thoracic duct, from antilymphocyte serum, 439-441
Lymphocytosis, suppressed by antiserum, 530-534
Lymphoid cells
affecting target cells, 400-401, 543-546
allogeneic, serum factors in elimination of, 577-579
inhibiting plaque-forming cells, 574-576
protein from, inflammatory reaction to, 624-625
role in immune response, 535-538
thymus affecting repopulation of, 614-615
Lymphomas, malignant, in transplantation patients, 106-111
Lysis of target cells. *See* Target cells

Macrophages
antigen in, immune response to, 539
immunoregulatory alpha globulin affecting migration of, 521-523
immunosuppressive antibody in, 524-526

Macrophages—(*Continued*)
splenic, antilymphocytic serum affecting, 433-434
Marrow
antilymphocyte serum affecting chimerism, 34-38
transplantation of, 16-46
and cyclophosphamide dosage, 44-45
in dogs, 31-33
immunological considerations in, 39-43
Medical problems of transplantation, 162-170
6-Mercaptopurine, affecting formation of antibody plaque-forming cells, 413-414
Migration
of macrophages, alpha globulin affecting, 521-523
of peritoneal cells, inhibition of, 400-401
Moloney leukemia virus, 85-88
Moloney sarcoma virus, 90-94
Mononuclear cells, infiltration in renal transplants, 1015
Morphological responses to transplanted kidney, 1022-1030, 1034-1035

Nephrotic syndrome, after renal transplant, 1001, 1029
Neutrophils
in experimental immunologic glomerulitis, 949-957, 1033
polymorphonuclear, in renal transplants, 1014, 1022

Organ preservation. *See* Preservation of organs

Pancreatic transplantation, 232-237
preservation of donor organ, 862
Parabiosis, alpha globulins affecting tolerance to, 506-510
Parathyroid disorders, in renal transplant patients, 179, 206-208
Passive antibody, minute doses of, immunosuppression by, 616-618
Passive transfer of serum. *See* Humoral factors
Perfusion, for organ preservation, 784-787
See also Preservation of organs
Peritoneal cell migration, inhibition of, 400-401
Permeability factor, lymph node, affecting renal allografts, 589-592
Phytohemagglutinin
immunosuppressive effects of, 622-623
stimulating lymphocytes. *See* Lymphocytes
Plaque-forming cells in spleen, 401, 413-414, 433-434, 436-438
inhibition by lymphoid cells, 574-576
response to two antigens, 567-569
thymectomy affecting, 535-538
Platelets
aggregation in renal transplants, 1024
antilymphocyte globulin affecting, 452, 457
and renal graft rejection, 305-310, 661
Polymorphonuclear leukocytes, in renal transplants, 1014, 1022
Polyoma oncogenesis, antilymphocyte serum affecting, 100-104
Polypeptide antigens, genetic control of antibody responses to, 548-550
Polyribonuclease, affecting lymphocytes, 511-514
Portal vein drainage, affecting second-set renal transplants, 602-604
Prednisone
and antilymphocyte globulin therapy, 448-453, 460
after heart transplantation, 700-701, 708
and renal graft survival, 283-286
Pregnancy and transplantations, 47-84
antigenicity of trophoblast, 53-59
choriocarcinoma and HL-A antigens, 76-81
differentiation of trophoblast giant cells, 61-66
fetus as allograft, 47-51, 71-74
immunological inertia of viviparity, 67-70
survival of Ag-B heterozygote progeny, 82-84
Preservation of organs, 126-159
assessment of organ function, 787-791, 852-861, 862-880
with freezing, 783-784
heart, 138-146, 147-151, 798, 834-838, 840-851
with hyperbaric pressure, 783, 796-797
for heart, 138-146
for lungs, 808-809, 812-816
with hypothermia, 781-783, 795-796, 817
for heart, 138-146, 798
for kidney, 797, 801-807, 810-812, 814, 817, 862-880
for liver, 798, 809-810, 814, 817
for lung, 797, 808-809, 812-816
kidney, 153-159, 797, 801-807, 810-812, 814, 817
and acid-base status, 825-833
and enzyme levels in effluent perfusates, 862-880
erythropoietin release from, 882-888

Preservation of organs, kidney—(*Continued*)
radioisotope assessment of function, 852-861
liver, 132-136, 798, 809-810, 814, 817, 819-823
lung, 797, 808-809, 812-816
with perfusion, 784-787
for heart, 147-151, 834-838
for kidney, 825-832, 852-861
for liver, 138-146, 147-151, 819-823
for lung, 808-809, 812-816
pharmacologic agents for, 784
and tissue banking problems, 126-131
xenogeneic storage of hearts, 840-851
Protein antigen
lymphocyte response to, 539-542
from lymphoid cells, inflammatory reaction to, 624-625
tolerance to, in vitro, 619-621
tolerance to low doses of, 571-572
Public attitudes toward transplantations, 670-674
Puromycin, affecting cytotoxic activity of lymphocytes, 416-419
Pyroninophilic cells, large, lytic reaction on target cells, 551-555

Radiation
of blood, extracorporeal, affecting skin graft, 583-584
chimeras from, antilymphocyte serum affecting, 34-38
Rauscher leukemia virus, 85-88
Rejection of grafts. *See* Cellular immunity; Humoral factors; *and specific graft sites*
Retransplantation
of kidney, 173-175
of liver, 222
second skin graft survival, 474-478
Rheumatic fever, streptococcal cross-reactive antigens in, 968-974
Ribonuclease
affecting lymphocytes, 511-514
and alpha globulin activity, 516-523
Rosette inhibition test of antilymphocyte serum, 403-407

Sarcoma, from Moloney virus, 90-94
Serotyping. *See* Histocompatibility
Serum components in transplantation, 506-534
alpha globulins, 506-510, 516-523
antiserum suppressing lymphocytosis, 530-534
See also Antisera
immunosuppressive antibody activity, 524-526, 616-618
polyribonuclease, 511-514
protective action of homologous component on graft rejection, 527-529
See also Humoral factors
Shwartzman reaction. *See* Kidney transplantation, hyperacute rejection of
Skin
new antigenicity of, in leukemic mice, 113-118
transplantations of
age of donor or host affecting, 560-563
after alpha globulin injections, 509
anti-A immunization affecting, 390-394
antilymphocyte serum affecting, 403, 442-444, 456, 474-478
effects of circulating antibody in, 390-394, 400-401
after extracorporeal irradiation of blood, 583-584
in hamster cheek pouch, 597-601
and HL-A types, 342-345, 385-394, 649-657
immunological principles in, 647
isografts producing allograft immunity, 593-596
and lactic dehydrogenase virus infection, 586-588
mouse-anti-mouse isoantiserum affecting, 445-446
polyribonuclease affecting, 514
serum fractions affecting rejection of, 527-529
streptococcal antigens and antibodies affecting, 638-644
survival compared with renal allograft survival, 395-399
survival of second grafts, 474-478
Specific immunologic suppression, 580-581
Spleen
antibody plaque-forming cells in. *See* Plaque-forming cells
donor spleen cells incubated with target cells, 574-576
pretreatment with splenic antigens, in renal allografting, 290-292
transplantation of, 239-245
Streptococcal cross-reactive antigens
and glomerulonephritis, 959-962, 1033
heart tissue reacting to, 976-979, 1034
and rheumatic fever, 968-975
in transplantations, 638-644
Streptococcal infections
experimental, in baboons, 992-993
glomerulonephritis after, in monkey, 985-991
Streptococcal membrane antiserum, kidney perfused with, 981-984

Suppression of immune response
with antilymphocyte serum. *See* Antilymphocyte serum
by passive antibody, 616-618
by phytohemagglutinin, 622-623
specific, 580-581
See also Immunosuppressive therapy
SV40 tumors, antigen on surface of cells in, 119-121

Target cells
incubated with spleen cells from donors, 574-576
lymphoid cells affecting, 400-401, 543-546
lysis by large pyroninophilic cells, 551-555
Thoracic duct lymphocytes
affecting immune response, 535-538
antilymphocyte globulin made from, 455-459
lymphopenia from antilymphocyte serum, 439-441
stimulated in vitro by protein antigen, 539-542
Thrombocytopenia, from antilymphocyte globulin, 452
Thymectomy
affecting H-2 antibody formation, 475-476
affecting renal graft survival, 283-286
and allogeneic inhibition, 544
after extracorporeal irradiation of blood, affecting skin grafts, 583-584
immunological activity after, 535-538
Thymocyte isoantiserum, mouse-anti-mouse, 445-446
Thymus
affecting lymphoid repopulation, 614-615
antilymphocyte serum affecting, 424-427
Tissue
banking of, problems in, 126-131
graft reaction in tissue culture, 551-555
isoantigens shared by rabbits and mice, 556-558
specific antibodies, 661-662
Tolerance
induced by antilymphocytic serum, 429-432
to protein antigen
in vitro, 619-621
low doses of, 571-572
Trophoblast
antigenicity of, 53-59
differentiation of giant cells, 61-66
Tumors
from adenovirus, and cytotoxic effects of antisera, 95-99
allogeneic inhibition affecting, 543-546
autochthonous, in mice, 90-94
endotoxin protection in Ehrlich ascites carcinoma, 124-125
immunoglobulin fractions affecting growth of, 530-534
after immunosuppressive therapy, 660
lymphomas in transplantation patients, 106-111
polyoma virus, antilymphocyte serum affecting, 100-104
skin neoantigens induced by chemical carcinogens, 113-118
from SV40 virus, antigen on surface of cells in, 119-121

Vinblastine, affecting formation of antibody plaque-forming cells, 413-414
Viruses
adenovirus antisera, cytotoxicity of, 95-99
and immune complex type of glomerulonephritis, 945-947, 1032-1033
lactic dehydrogenase infection, affecting antibody formation, 586-588
leukemia from, 85-88
and neoantigens in skin, 113-118
polyoma virus affected by antilymphocyte serum, 100-104
sarcoma from, 90-94
SV40 tumors from, antigen on surface of cells in, 119-121

Xenogeneic storage, of primate hearts, 840-851
Xenografts, 251, 668
corneal, 256-257
of hearts, 753